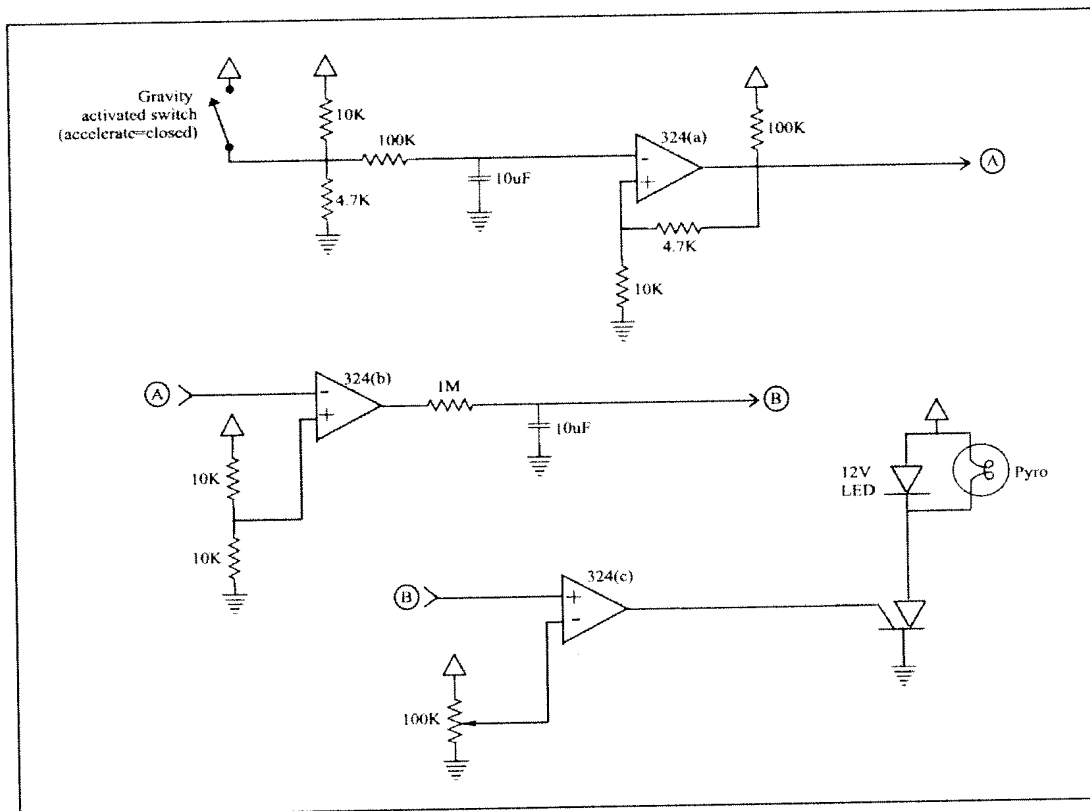


Super Simple Analog Timing Circuit



Concept:

The basic idea of the circuit illustrated above is a resistor-capacitor timing network, fed into an Op-Amp comparator. By varying the resistance in the variable resistor in the third line, the timing interval is changed.

Details:

Consider the pyro timing RC network first. After the trigger conditions are met, the capacitor in the second line slowly charges. The output at (B) is compared to the output generated by the variable resistor in the third line. When the Op-Amp detects that the voltage at (B) has exceeded the voltage generated by the variable resistor, the Op-Amp triggers the SCR in the third line, which fires the pyro charge.

The first line of the diagram applies the same logic in order to provide a 0.25 second trigger debouncer. I.e., after the switch closes, the capacitor in line one charges until the voltage at the (-) terminal of 324(a) crosses below the voltage at the (+) terminal of the Op-Amp. It takes approx 0.25 seconds for the capacitor to charge and the Op-Amp to go low. The Op-Amp 324(a) acts like a one-shot, and once activated does not deactivate.

Note that other values for the resistors and capacitors are possible. The values identified above are just one example of a working circuit. Also possible is to make a circuit which activates when the trigger switch opens (eg launch pull-pin) instead of closes as shown. This is left as an exercise to the reader. :)

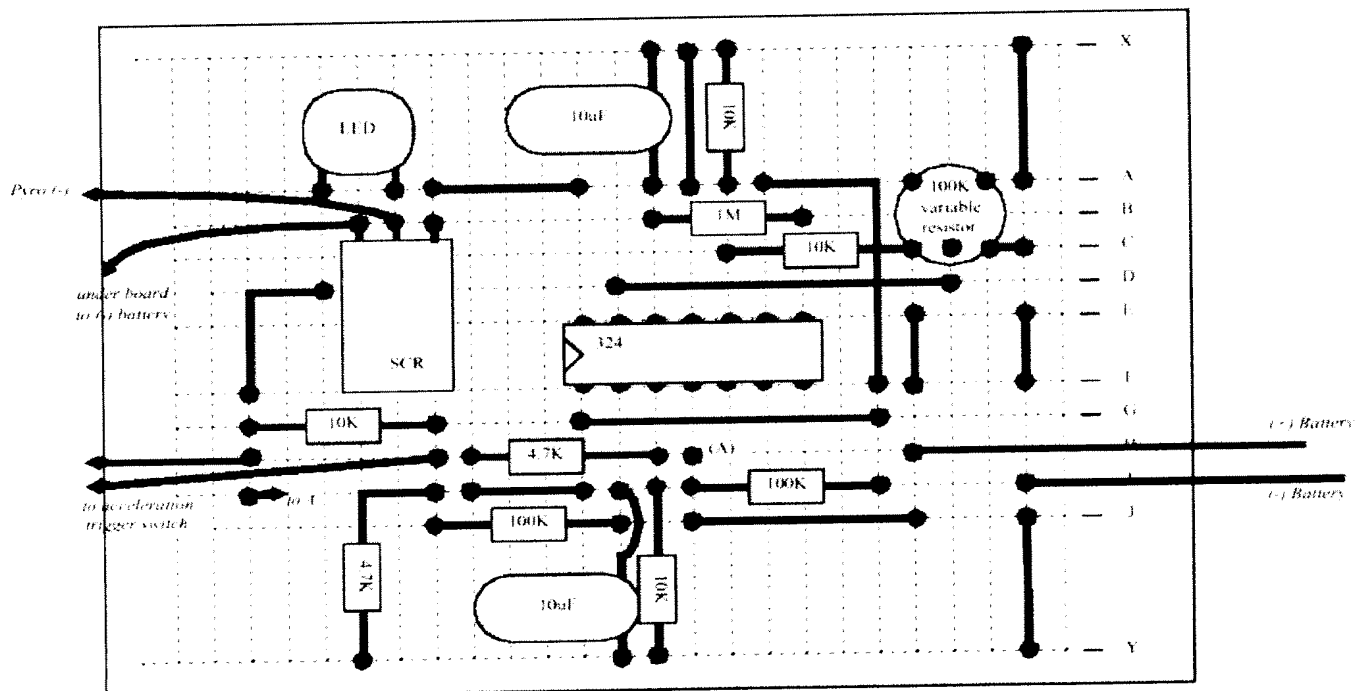
Parts:

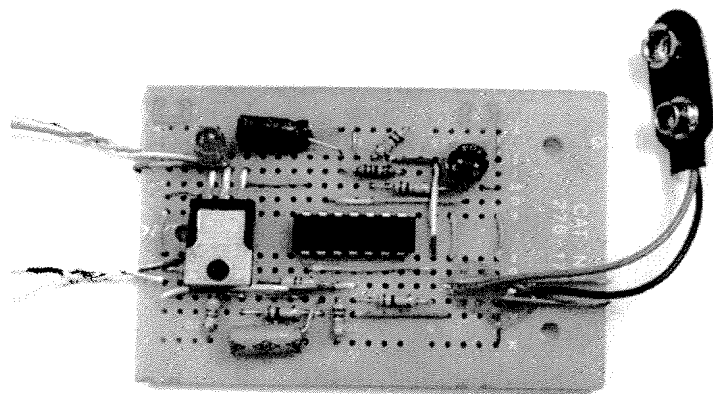
- Qty 1: 324 Op-Amp
- Qty 1: 12V LED
- Qty 1: 100K PCB variable resistor
- Qty 2: 4.7K resistor
- Qty 4: 10K resistor
- Qty 3: 100K resistor
- Qty 1: 1M resistor
- Qty 2: 10uF capacitor
- Qty 1: Radio Shack project board #276-170
- Qty 1: micro switch

Layout:

The image below shows one implementation of the simple timer circuit which does not require etching a PCB. A Radio Shack project board (part #276-170) is cut in half and wires/resistors/etc are soldered as shown.

Other board layouts, including etching a PCB, may work better. This is just one example of a working circuit.





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Use:

To use the simple timer circuit, connect a 9 volt alkaline battery. Trigger the acceleration trigger switch, and using your wrist-watch measure the time until the LED changes state. By trial and error adjust the 100K variable resistor until the time is correct. Note that the battery must be disconnected for several seconds before recycling the timer.

Once the resistor is set, load the pyro charge and put the timer into your rocket.



Return

I'm having TOO MUCH FUN!!!!!!



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